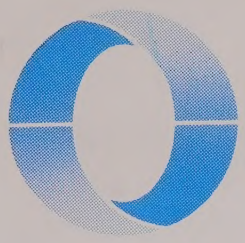


Macbeth®
A division of
Kollmorgen Corporation

Transmission Densitometer TD-929

Operator's Manual

CHANGE NO. Addendum

DATE 3/12/82

INSTRUCTION BOOK CHANGE NOTICE

MANUAL AFFECTED _____ (ISSUE DATE: _____)

All 500 Series Operation Manuals, 500 Series Service Manuals, 900 Series Operation Manuals and 900 Series Service Manuals.

DENSITOMETER AC POLARITY REQUIREMENTS

Macbeth densitometers are equipped with a earth ground pin on all line cord plugs. The electronic design of the densitometer incorporates a earth ground as part of the electronic system. All AC wall power receptacles must also be properly phased and have an earth ground. If you are in doubt about your wall AC power connections, you can purchase an AC phasing circuit tester from a good electrical or electronic supply distributor. Approximate cost is $16.00.

CAUTION

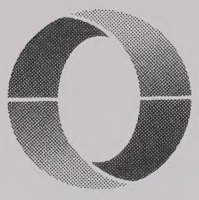
To insure proper operation and safety, this ground pin must not be removed. Removal of the connections can damage and cause the instruments to malfunction. Also if the unit is touched and the person operating it touches something else which is metal, the current will flow through that person to ground.

EXPLANATION

If a unit is not grounded properly, a voltage spike on the AC line can cause the ground reference to go between .8 volts and 2 volts - this is referred to as being undefined in electronics. If it is either a high (2 to 5 volts) or a low (0 to .8 volts), this will cause the components to have either high or low states at random, causing erractic operation, loss of memory or total failure.

Macbeth
A division of
Kollmorgen Corporation

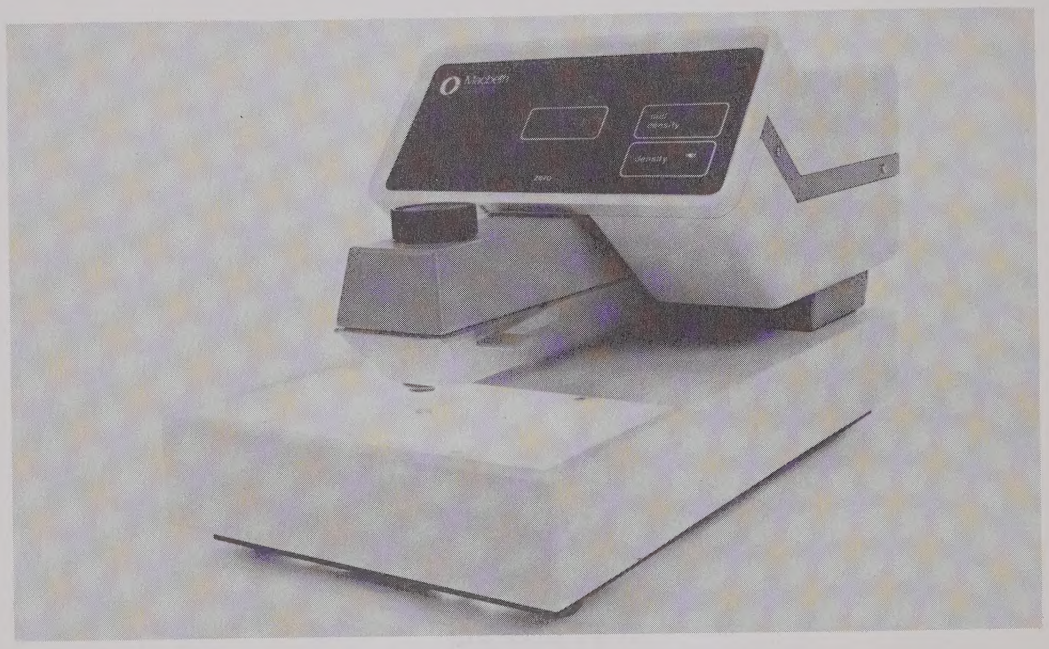
Little Britain Road, P.O. Box 950, Newburgh, New York 12550



Macbeth®
A division of
Kollmorgen Corporation

OPERATOR'S MANUAL FOR TD-929 TRANSMISSION DENSITOMETER

ISSUE DATE: JUNE 1982



MACBETH MICROFILM TRANSMISSION DENSITOMETER

TD-929

ISSUE DATE: June, 1982

The TD-929 is a transmission densitometer designed for use in the quality control of microfilm products. The filters, apertures, and programmed functions provided in this instrument will give accurate information of the type required in this application.

-SPECIFICATIONS-

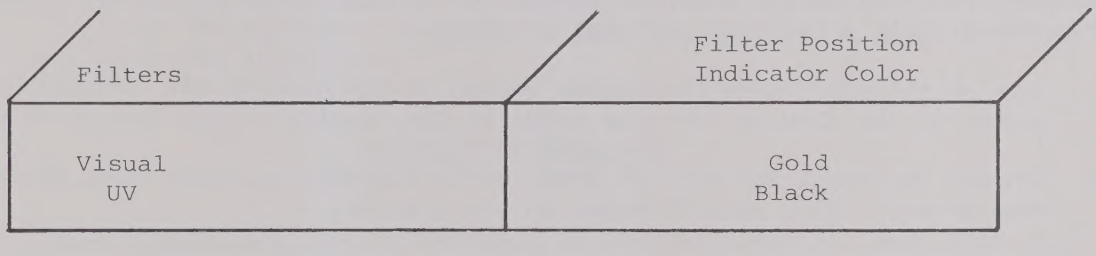
Power Requirements:

120 VA, 105-130 Volts at 50/60 HZ, or

120 VA, 210-260 Volts at 50/60 HZ, or

120 VA, 90-110 Volts at 50/60 HZ.

Full Performance Temperature Range: 10-40°C



Measurement Mode:

Opal Glass Diffuse Density/Null Density

Measuring Range:	2, 3mm Aperture	1mm Aperture
Density, Visual:	0.00-4.00D	0.00-4.00D
Density, UV:	0.00-3.00D	0.00-2.5D
Null Density:	Within density limits specified above.	
Accuracy:	±.02D	
Repeatability:	±.01D	
Apertures:	1, 2, 3mm	

-DIGITAL DISPLAY INFORMATION CODES-

UUU

Three U's appear in the display when the filter wheel is set between filter positions.

CCC

Three C's appear in the display whenever you attempt to take readings in a filter position that has not been zeroed (see calibration procedure).

-CALIBRATION-

Warning: Before turning on the unit, make sure that the line voltage being used and the voltage rating for the unit are the same. Macbeth densitometers are equipped with an earth ground pin on all line cord plugs. The electronic design of the densitometer incorporates the earth ground as an essential part of the electronic system and is required for proper operation. To insure that the instrument performs properly and to insure the safety of the person operating the instrument, this ground pin must not be removed.

1. Turn on the unit using the rocker switch on the back panel. Three C's should appear in the display, and the light in the density button should come on.

2. Depress the snout and hold it down; while holding the snout down, press the ZERO button. 0.00 should appear in the display.

3. Rotate the filter wheel; depress the snout and push the zero button for each filter position. When the snout is depressed in a filter position that has not been zeroed, three C's appear in the display.

The remaining steps of the Calibration Procedure need only be performed periodically:

4. After all the filter positions have been zeroed, rotate the filter wheel to the "visual" position.

5. Place the film strip provided over the sampling aperture.

6. Depress the snout and hold it down. Adjust the CAL TRANS pot on the back panel until the displayed reading matches the value on the strip of film. This completes the calibration procedure.

-OPERATION-

DENSITY MODE: If the unit is properly calibrated, take absolute density readings as follows:

1. Press the DENSITY button. The light in the button should come on.
2. Select the filter position you wish to use.
3. Readings can be taken by depressing the snout.

NULL DENSITY MODE: If you want to take density readings relative to a standard sample, proceed as follows:

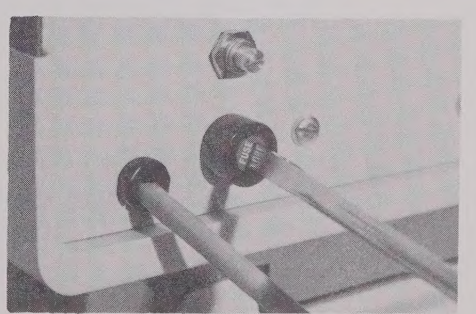
1. Press the NULL DENSITY button. The light in the button should come on.
2. Depress the snout on the sample which is to be the standard. While holding the snout down, press the zero button.
3. Take readings normally, a negative reading indicates a density lower than the standard. A positive reading indicates a density higher than the standard.

-OPERATOR MAINTENANCE-

Warning: Before performing any maintenance on the densitometer, make sure that the unit is unplugged. Failure to unplug the unit could result in personal injury, and damage the instrument.

FUSE REPLACEMENT: To replace the fuse in the unit, unscrew the red center section of the fuse holder. Replace the fuse with the appropriate part listed below.

Note: Do not replace the fuse with one with a higher rating. If a replacement fuse blows immediately, there is another problem which is causing the fuse to blow.



Unit Voltage	Macbeth Part No.	Description
110 VAC	31015000	1.5 amp #3 AG Slo Blo
220 VAC	31007000	3/4 amp #3 AG Slo Blo

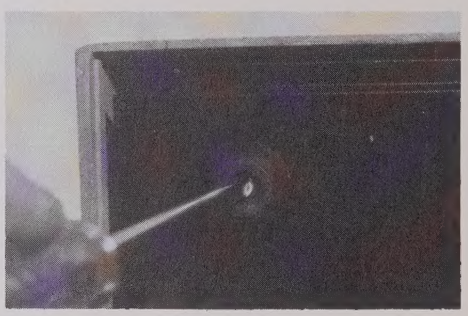
-OPERATOR MAINTENANCE-

SPARE LAMP

A spare lamp is provided with the instrument and is located inside the instrument base. To replace the lamp, see the "Lamp Replacement" procedure below. Be sure to reorder replacement lamps for future use; average lamp life is 1,000 hours. Additional lamps (Macbeth Part No. 30950000) can be purchased from Macbeth or your dealer.

LAMP REPLACEMENT: To replace the lamp in the unit, first make sure the power cord is not plugged in. Then proceed as follows:

1. Remove the bottom cover by unscrewing the four screws in the feet.

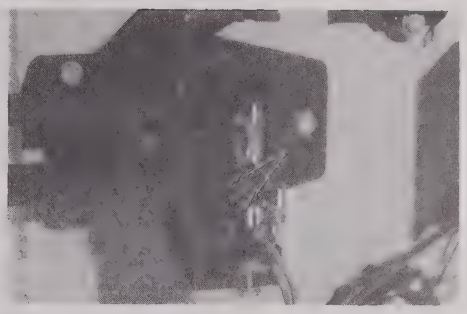


2. Loosen the two screws which hold the lamp tightly in place.

3. Pull the old lamp out of the socket.

4. Replace with a lamp, Macbeth Part No. 30950000. DO NOT TOUCH THE BULB WITH YOUR FINGERS. Use a piece of paper wrapped around the bulb to protect it. Push the bulb so that it is solid in the socket.

-OPERATOR MAINTENANCE-



5. Retighten the two small screws which hold the lamp tightly in place. Make sure the two metal plates at the base of the lamp to which these screws are attached are in the position shown.

6. Replace the bottom cover. This procedure is now completed.

CLEANING: Periodically, the lens directly under the stage plate should be cleaned. To do this, proceed as follows:

1. Remove the four screws which hold the plastic stage in place. The stage is the rectangular white plastic piece which contains the aperture.

2. The lens immediately below the aperture is the one which should be cleaned.

3. First, use a can of compressed air to blow the dust off the lens.

4. Next, use alcohol and lens tissue to gently clean the lens.

5. Use the can of compressed air to blow dust off the mirror which is directly under the lens assembly. DO NOT TOUCH THE MIRROR, as it is easily damaged.

6. Replace the stage plate and screws.

If there is a very noticeable film on the mirror which is not removed by air, the mirror should be cleaned VERY GENTLY with distilled water and lens tissue. DO NOT APPLY PRESSURE when using the lens tissue; this mirror should only be cleaned if absolutely necessary, as it is damaged VERY easily.

FOR YOUR CONVENIENCE

We've bound this over-sized envelope into your Manual. In addition to providing a protected storage spot for the accessories of your instrument, it will be a handy place for you to keep all of the records and standards which you'll want to save for future reference.

IMPORTANT SAFEGUARDS

When using your Macbeth instrument and associated equipment, basic safety precautions should always be followed, including the following:

1. Read and understand all instructions.

2. Care must be taken as burns can occur from touching hot parts.

3. Do not operate appliance with a damaged cord or if the appliance has been dropped or damaged - until it has been examined by a qualified serviceman.

4. Do not let cord hang over edge of table or counter or touch hot surfaces.

5. If an extension cord is necessary, a cord with a suitable current rating should be used. Cords rated for less amperage than the appliance may overheat. Care should be taken to arrange the cord so that it will not be tripped over or pulled.

6. Always unplug appliance from electrical outlet when not in use. Never yank cord to pull plug from outlet. Grasp plug and pull to disconnect.

7. Let appliance cool completely before putting away. Loop cord loosely around appliance when storing.

8. To protect against electrical shock hazards, do not immerse this appliance in water or other liquids.

9. To reduce the risk of electrical shock, do not disassemble this appliance, but take it to a qualified serviceman when some service or repair work is required. Incorrect reassembly can cause electric shock when the appliance is subsequently used.

10. SAVE THESE INSTRUCTIONS.

SERVICE REQUEST

If your instrument requires service, complete the following and enclose with the instrument.

Is Instrument In Warranty? _____Yes _____No. If Yes, proof of purchase must be attached; invoice or packing list will suffice.

Instrument Model _____ Serial No. _____

Your Name _____

Your Company _____

Street _____

City _____ State _____ Zip _____

Telephone No. ( ) - _____ Extension _____

Urgency Required _____

Return Carrier _____

Description of Malfunction or Service Required: _____

_____

_____

_____

Is Malfunction Intermittent? _____Yes _____No. If Yes, describe: _____

_____

Is Malfunction Time Related? _____Yes _____No. If Yes, describe: _____

_____

The above information will expedite service and minimize expense.

Warranty

DENSITOMETERS

Seller warrants that at the time of shipment from Seller's factory, the goods supplied hereunder will be of the kind described herein and in any specifications or drawings referenced herein and will be free from defects in material and workmanship. Such warranties are conditioned upon any claim being made pursuant to such warranties, in the manner set forth below, within one (1) year [two (2) years in USA, Canada and Western Europe] following the date of customer's receipt of the goods.

These warranties shall not apply to any goods supplied hereunder which after Seller's shipment are damaged, altered in any respect, or subjected to unauthorized repair, tampering or negligent treatment. Lamps, fuses, batteries, air filters, and other expendable components of the goods supplied hereunder are not warranted in any respect.

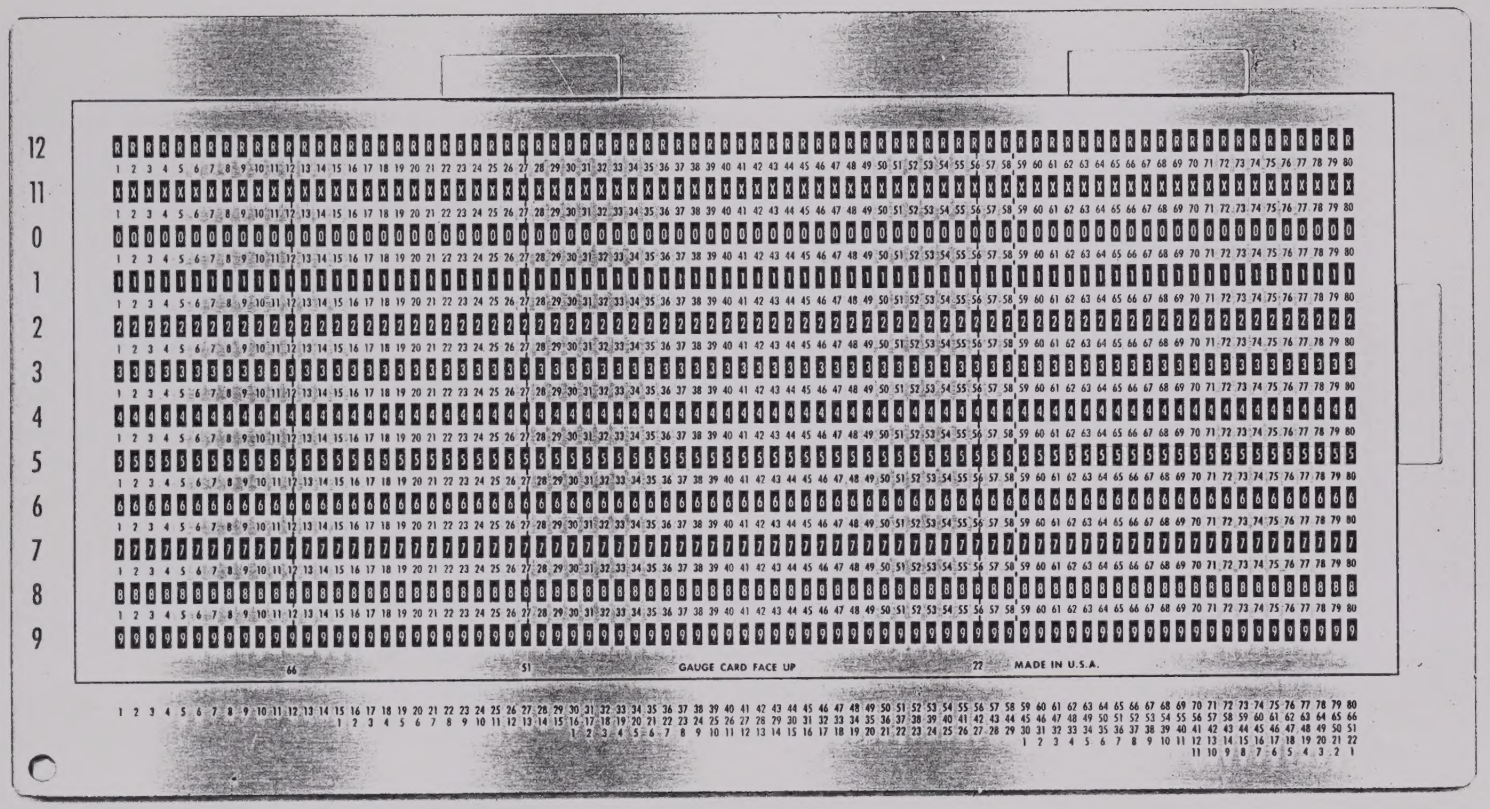
Seller's sole and exclusive obligation for breach of the above warranties shall be the repair or replacement of any part (or the complete units, at Seller's option), without charge, which within the warranty period is proven to the Seller's reasonable satisfaction to have been defective, provided further, that the Seller may require to return to its factory of the allegedly defective material or goods in order to establish the claim. Buyer will bear any transportation costs incurred.

Repairs or replacements by Seller shall not revive an otherwise expired warranty, nor shall the same extend the duration of a warranty.

The Seller shall in no event be liable for losses or costs to Buyer in manufacturing, or for Buyer's overhead, other expenses, lost profits, goodwill, or any other special, indirect, consequential, incidental, or other damages to persons or property resulting from a breach of any of the foregoing warranties.

THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, WHICH EXTEND BEYOND THE WARRANTIES SET FORTH HEREIN. THE EXPRESS WARRANTIES CONTAINED HEREIN ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. NO REPRESENTATIONS OR STATEMENTS NOT EXPRESSLY SET FORTH HEREIN SHALL BE BINDING UPON SELLER AS A WARRANTY OR OTHERWISE.

Macbeth®
A division of
Kollmorgen Corporation


12
11
0
1
2
3
4
5
6
7
8
9
66
51
GAUGE CARD FACE UP
22
MADE IN U.S.A.

Macbeth
Division of
Kollmorgen Corporation

Little Britain Road
P.O. Box 950
Newburgh, N.Y. 12550
Tel: (914) 561-7300
Telex: 13-1406/Cable MACBETH NBUR